Potential principles for greening space systems

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Summary

1. ESA background
2. Sustainability requirements
3. Sustainability principles
4. Reporting aspects
5. ESA’s actions towards greening/ cleaning space activities

The corporate ambition

ESA Director General's strategic plan, Agenda 2015:

"ESA tomorrow has the ambition of being a model agency for clean, responsible and sustainable space activities".

How to achieve this ambition?

➔By seizing the opportunity to explore the integration of "greener" or "cleaner" solutions in our missions (e.g. use of the LCA methodology, eco-design, green engineering, clean-tech, etc.).

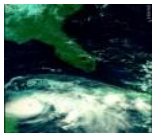
➔By undertaking a deeper analysis and understanding of the environmental impacts of space programs thus having the necessary know-how to be more active for facing legislation on this topic and to drive technical and scientific innovation in the space industry. This has also a market impact because customers of space applications will require more and more responsible behaviours.

ESA's holistic approach to SD

Space for SD on Earth


Resource management


Meteorology / Climate change monitoring

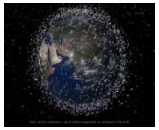

Disasters management

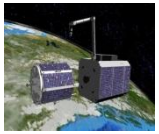

Telecommunications / Telemedicine
Telehealth /Telelearning


Navigation and positioning

ESA & SD

SD in space


Space debris mitigation


Space debris remediation / removal


Codes of conduct for
Space operations /
Space traffic management

SD in the space sector


Responsible use of energy /
Care for the environment
at space sector sites


Use of hazardous substances


Good management and
social responsibility
(HR and Health & Safety


Transfer of
space technologies for
SD innovation and products


Ecodesign and
Life Cycle Assessment

Sustainability requirements

1. Legal requirements: related to legal risks (incl. non-compliance). Concern materials and processes, supply-chain management, space debris mitigation and remediation (through Codes of conduct).
2. Risk-oriented approach: it starts by an image/ reputation risk due to lack of transparency and clarity in communication. Importance of reporting and awareness actions towards general public. But there are also risks for space activities self linked to either natural (space weather) or man-made threats (debris).
3. Accountability: space agencies are accountable towards their Member-State(s) and citizens (tax payers), for a sound and efficient use of public money and the creation of societal values. Correlated requirement: to report on sustainability to stakeholders in a clear and transparent way.
4. Responsible organisation and space agency: 2 aspects: being cleaner both on the human-related part of management and cleaner and greener on environmental aspects (on-site operations and programs).

Sustainability principles

° A framework policy on Sustainable Development with 3 chapters:

Environment & Energy/ Program activities/ Governance & Ethics

° Generic international standards and specific principles applicable to the space field.

° Clean Space initiative will use clean technologies: *defined by ESA as those contributing to the reduction of the environmental impact of space programs, taking into consideration the overall life-cycle and the management of residual waste and pollution resulting from space activities, both in the Earth eco-sphere and in space.*

Encompasses 4 branches:

1➔ Eco-design: to evaluate the environmental impact and monitor legislation risk

2➔ Green Technologies: green propulsion, green electronics, new materials and processes

3➔ *S*pace debris remediation: technologies to support end of life operations

4 ➔ Space debris mitigation: technologies for active debris removal.

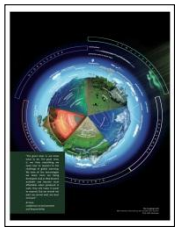
Studies are undertaken to improve understanding

ESA Sustainable Development 2009-2010 report

Governance and ethics of space

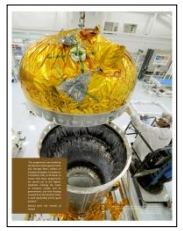
Space programmes contributing to a sustainable society

Managing our environment responsibly



ESA Sustainable Development Report 2009–10

Relations with partners and suppliers



Human Resources and social responsibility

Evolution of reporting on SD with KPI

Objective: to deploy and assess, in an optimal way, the Agency's framework policy and support sustainability-related objectives from Agenda 2015.

2008-2009

Mapping of ESA's activities by using and adapting international SD standards (from the Global Reporting Initiative). 30 criteria identified divided into 5 themes.

2010-11

First generation of KPI elaborated with GRI and ISO 26000 guidelines, published in ESA 1st Sustainable Development report, 2009-10.

2011-12

Second generation of KPI + definition of associated concrete goals. To be disclosed in ESA Sustainable Development report, 2011-12, early 2013 .

Actions within ESA

- Launch of a series of SD workshops comprising actors of the space sector as well as leading institutions and companies in other fields (e.g. CNES, DLR, EADS, Thalès, GE, Hilton, Rhodia-Solvay, ST Microelectronics,Thalys) to exchange best practices and unify approaches in the space sector.
- Specific activities: Spaceship EAC project, grassroots activities (e.g. Green Energy Club at ESTEC)
- Programmatic issues at the Ministerial C 2012 package relevant for SD: in particular Clean Space.
- Preparation of next biennial ESA SD Report 2011-12
- Setting up an SD award together with the European Inter-parliamentary Space Conference (EISC), demonstrating the high political profile of SD

Actions in the space sector as a whole

- Anchoring Sustainable Development in the corporate strategies of all actors in the space sector (agencies, research establishments, industry)
- Development of shared Key Performance Indicators and associated goals
- Joint approach for dealing with relevant regulations (e.g REACH, RoHS)
- Establishment of Environmental Management Systems in the sector (e.g. certifications ISO 14001, BREEAM)
- Presenting the European sector in relevant global organs promoting the use of space applications for SD (e.g. Earth summit Rio +20)
- Further developing of SD in space through space debris mitigation and remediation as well as space traffic management (e.g. in UNCOPUOS)
- Cooperation with NASA (and partners) on different Sustainability issues through joint task forces and international workshop activities.

As regards sustainability, space is certainly the solution and must not be the problem, so we must try and green our systems.